SEARCH FOR THE ROTATIONAL SPECTRUM OF THE β -CYANOVINYL RADICAL

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A fundamental question in the field of astrochemistry is whether the molecules essential to life originated in the interstellar medium and, if so, how they were formed. Nitrogen-containing heterocycles are of particular interest because of their role in biology. The discoveries of these molecules on meteorites provide evidence to support an interstellar origin. Yet, while many N-containing species have been identified in the interstellar medium, N-heterocycles have not, perhaps due to their susceptibility to UV photolysis. Recently, the β-cyanovinyl radical (HCCHCN) was implicated in the low temperature formation of N-heterocycles. While neutral vinyl cyanide (H_2CCHCN) has been rotationally characterized and detected in the interstellar medium, HCCHCN has not. In order to understand how this radical contributes to interstellar chemistry, further study is needed. We have launched a search for the rotational spectrum of HCCHCN using both cavity and broadband FTMW spectrometers, the current status of which will be discussed in this talk. Rotational characterization of this radical will enable a search in the interstellar medium and further experimental work on the low temperature formation of N-heterocycles.